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BOTANY.—*New Korean grasses and new names of grasses to be validated before publication of a manual of the grasses of Korea*. IN-CHO CHUNG, Botanical Gardens, University of Michigan. (Communicated by H. H. Bartlett.)

(Received February 3, 1955)

The writer has prepared a *Manual of the grasses of Korea* which, before publication as a book, will be microfilmed, since it has been presented as a dissertation at the University of Michigan. Since publication by microfilm is not recognized as valid by the International Rules of Botanical Nomenclature, it is necessary to extract for prior journal

publication the new Korean taxa which are proposed, as well as certain names in new combinations required for uniformity of treatment in the *Manual*.

The purpose of the *Manual* is to give full descriptions, with clear-cut keys to all categories, of all known grasses of Korea, both South and North. The only grasses excluded

from the work are cultivated bamboos. The treatment is based as largely as possible upon material actually collected in Korea, which is available in the United States National Herbarium at the Smithsonian Institution, the Gray Herbarium of Harvard University, the University Herbarium of the University of Michigan, and the Herbarium of the New York Botanical Garden.

If material from Korea or closely adjacent regions was not available, the descriptions were either translated from the original ones, or, if those were too old and inadequate, from the best and most dependable monographs, or floras of the type regions.

So far as now known there are two hundred species of grasses in eighty-five genera in Korea, excluding cultivated bamboos.

One Siberian species, *Poa sibirica* Roshevitz, is new to Korea, and one Korean species, *Stipa pubicalyx* Ohwi, has been found to extend to the Soviet Far East, and so far as can be ascertained, is new to that country.

Three species, three varieties, and five forms are newly proposed; seven varieties and three forms have required framing new combinations in order to bring their names into conformity with the general treatment.

The descriptions of the new taxa follow:

***Poa hamhungensis* Chung, sp. nov.**

P. viridulae similis sed differt culmis longioribus, lemmatibus obscure 5-nerviis, et palea lemma aequante.

Culmi pauci in caespite singulo, ascendentes, 55-65 cm alti, graciles, subteretes, 3-nodii, nodo ultimo infra culmi mediam, striati, scaberuli; vaginis superioribus quam internodiis brevioribus, scaberulis; laminis linearibus, acuminatis, plerumque brevioribus quam vaginis, 8-10 cm longis, 1.5-2 mm latis, scaberulis, ligulis 1-2 mm longis, obtusis, dorso scaberulis. Panicula angusta, 9-11 cm longa, ramis 2-4 ad nodum singulum; rachi et ramis scabris; ramis inferioribus 1.5-3 cm longis, in parte tertia inferiori nudis; spiculis viridibus 4.5-5 mm longis, 3-4-floris; glumis lanceolatis, chartaceo-membraneis, margine scariosis, 3-nerviis, scaberulis, prima acuminata, 2-2.5 mm longa, secunda acuta, 2.4-2.8 mm longa; lemmatibus 2.7-3 mm longis, acutis vel acutiusculis, apicem versus flavis purpureisque, obscure 5-nerviis, sursum scaberulis, villosis deorsum in parte carinae

dimidia et in tertia parte vernarum marginalium, glabris in vena intermedia et inter venas, basi arachnoideo-lanosis; palea lemma aequante, ciliolata in carinis ambabus; staminibus 3; antheris 1 mm longis, flavidis; rachilla glabra, minute scaberula. Specimen typicum legit T. Suzuki sub num. 8, anno 1941, ad locum Hamhung ("Kanko" dictum), in Hamkyong-Namdo, in U. S. Nat. Herb. conservatum sub num. 1,964,757.

Similar to *P. viridula* but differs from it in the taller culms, the faintly 5-nerved lemmas, and the palea equaling the lemma.

Culms few in a tuft, ascending, 55 to 65 cm tall, slender, nearly terete, 3-noded with the uppermost node below the middle of the culm, striate, scaberulous; upper sheaths shorter than the internodes, scaberulous; leaf-blades linear, acuminate, mostly a little shorter than the sheath, 8 to 10 cm long, 1.5 to 2 mm wide, scaberulous, ligules 1 to 2 mm long, obtuse, scaberulous on the back. Panicle narrow, 9 to 11 cm long, with 2 to 4 branches at each node; axis and branches scabrous; the lower branches 1.5 to 3.5 cm long, naked on the lower third; spikelets green, 4.5 to 5 mm long, 3- or 4-flowered; glumes lanceolate, chartaceous-membranaceous with scarios margins, 3-nerved, scaberulous, the first acuminate and 2 to 2.5 mm long, the second acute and 2.4 to 2.8 mm long; lemmas 2.7 to 3 mm long, acute or acutish, yellowish and purplish near the tip, faintly 5-nerved, scaberulous above, villous on the lower half of the keel and on the lower third of the marginal veins, glabrous on the intermediate vein and between the veins, wavy-haired at base; paleas equal to the lemma, ciliolate on the 2 keels; stamens 3; anthers 1 mm long, yellowish; rachilla glabrous, minutely scaberulous.

Type specimen: *T. Suzuki* 8 (US 1,964,757) collected in 1941 at Hamhung, Hamkyong-Namdo.

***Poa kyongsongensis* Chung, sp. nov.**

Poa matsumurae similis sed differt spicula majori 5-8-flora, vagina longiore quam internodio.

Culmis ca. 57 cm longis, compressiusculis, basi 2 mm crassis, 2-nodosis, nodo superiore infra culmi mediam, infra nodos et infra inflorescentiam scaberulis; vaginis quam internodiis longioribus, compressiusculis, striatis; laminis planis, linearibus, acutis, 10.5-13 cm longis,

2-2.2 mm latis, glabris, scaberulis, infima basi purpurascenti; ligula membranacea, 2-3 mm longa, obtusa, in dorso scaberula; panicula laxa, ca. 18.5 cm longa, rhachi ramisque scabris, ramis ascendentibus, infra mediam nudis, inferioribus quinque fasciculatis, fasciculis ex ramis 2 brevibus, 2 intermediis et 1 longissimo (9.7 cm longo) constantibus; spiculis viridibus, 5.5-7.5 mm longis, 5-8-floris; glumis lanceolatis, acutis, chartaceis, margine scariosis, 3-nerviis, in costa scaberulis, prima 2.8-3 mm longa, secunda 3-3.5 mm longa; lemmatibus 3.3-3.5 mm longis, 5-nerviis, obtusis, chartaceis, margine scariosis, apice flavescens purpurascensque, secus margines purpurascens, punctatim scaberulis, glabris in vena intermedia et inter venas, pubescentibus deorsum in parte carinae dimidia et in tertia parte venarum marginalium, basi arachnoideis; palea paulum brevior quam lemmata, ciliolata in costis; antheris (immaturis) 1-1.3 mm longis; rachilla glabra, minute scaberula.—Specimen typicum legit Ohwi prope Kyongsong in provincia Hamkyong-Pukto, Korea, 881 *pro parte* (!) in U. S. Nat. Herb. conservatum sub num. 1964478. Partes inferiores desunt. Specimen alterum est *Poa sphondylodes*.

Similar to *Poa matsumurae* but differs from it in the longer, 5- to 8-flowered spikelet and the sheath which is longer than the internode.

Culm 57 cm long, slightly compressed, 2 mm wide at base, 2-noded with the uppermost node below the middle of the culm, scaberulous below the inflorescence and nodes; sheaths longer than the internodes, slightly compressed, striate, scaberulous; leaf-blades flat, linear, acute, 10.5 to 13 cm long, 2 to 2.2 mm wide, glabrous, scaberulous, the lowermost purplish at base; ligules membranaceous, 2 to 3 mm long, obtuse, scaberulous on the back. Panicle open, 18.5 cm long; axis and branches scabrous; branches ascending, naked below the middle, the lowermost ones in a fascicle of 5 (2 shortest, 2 intermediate, the other longest and 9.7 cm long). Spikelets green, 5.5 to 7.5 mm long, 5- to 8-flowered; glumes lanceolate, acute, chartaceous, with scarios margins, 3-nerved, scaberulous on the keel, the first 2.8 to 3 mm long, the second 3 to 3.5 mm long; lemmas 3.3 to 3.5 mm long, 5-nerved, obtuse, chartaceous, with scarios margins, yellowish and purplish near the tip, purplish near the margins, punctate-scaberulous, glabrous on the intermediate nerve and between

the veins, pubescent on the lower half of the keel and on the lower third of the marginal veins, wavy-haired at base; paleas a little shorter than the lemma, ciliolate on the 2 keels; anthers (immature) 1 to 1.3 mm long; rachilla glabrous, minutely scaberulous.

Type specimen: *Ohwi 881* (US 1,964,478) *P.P.*, collected at Kyongsong, Hamkyong-Pukto. This, without the basal part, is one of the two plants found on US 1,964,478 collected by Ohwi on June 2, 1930, at Kyongsong, the other being *Poa sphondylodes*. *Poa penicellata* Kom. in Kamchatka may be remotely related to *Poa matsumurae* and *Poa kyongsongensis*.

Poa ullungdoensis Chung, sp. nov.

Poa nemoralis affinis, sed differt panicula angustiore ramis appressioribus foliisque plerumque involutis. A *P. kumgansani* differt culmis compressis, 5-8-nodiis et spiculis parvioribus, glumis brevioribus.

Perennis; culmis caespitosis, 25-40 cm altis, gracilibus, simplicibus, basi geniculatis, 5-8-nodiis; vaginis haud apertis, saepe quam internodiis longioribus, eis inferioribus purpurascens, ut culmis compressis, striatis, glabris, laevibus; laminis anguste linearibus, 9-17 cm longis, saepissime involutis, 1-2 mm latis si applanatis, glabris, margine scaberulis; ligulis truncatis, 0.2 mm longis. Panicula 5-10 cm longa, 1-1.7 cm lata, ramis 2-5 ad nodos inferiores, appressis, haud verticillatis sed fasciculatis; ramis plus minusve scaberulis, vel simplicibus vel circa mediam partem ramosis, prope apicem pauci-spiculiferis, infinis 2.2-4.8 cm longis. Spiculae 2.8-5 (raro 7) mm longae, 2-6-floriferae, plerumque 4-floriferae; glumis subaequalibus vel vix inaequalibus, prima 1.2-2.2 mm longa, 1-costata, secunda 1.7-2.8 mm longa, 3-costata; carinis scaberulis vel laevibus; lemmate obscure vel conspicue 5-nervio, basi pilis undulatis praedito, subtus in costa pubescenti etiamque prope basem venarum marginalium, sed sursum et inter venas glabro; palea lemmate subaequali, 2-costata, costis scaberulis, apice indistincte 2-dentata vel integra; staminibus 3; antheris 1.2-2 mm longis, luteolis; lodiculis 2, membranaceis, cuneatis, emarginatis, 0.2-0.3 mm longis. Specimen typicum legit Chung (no. 1673) ex insula Ullung Do, 1 Jul. 1948; Oh 2479 etiam ex Ullung Do (amboobus in herb. Univ. Michiganensis conservatis).

Close to *P. nemoralis* but differs from it in the narrow panicle with appressed branches and the

usually involute leaves. Also distinguished from *P. kumgansani* by the compressed 5- to 8-noded culms and the smaller spikelets with shorter glumes.

Perennial; culms tufted, 25 to 40 cm tall, slender, simple, bent at base, 5- to 8-noded; sheaths closed, usually longer than the internodes, the lowermost ones purplish; culms and sheaths compressed, striate, glabrous, smooth; blades very narrowly linear, 9 to 17 cm long, usually involute, 1 to 2 mm wide when spread, glabrous, scaberulous on the margins; ligules truncate, 0.2 mm long. Panicle 5 to 10 cm long, 1 to 1.7 cm wide, with 2 to 5 appressed branches (not whorled) at lower nodes; branches more or less scaberulous, simple or branched near or above the middle, bearing a few spikelets at the ends, the lowermost branches 2.2 to 4.8 cm long. Spikelets 2.8 to 5 rarely 7 mm long, 2- to 4-, rarely 6-flowered; glumes slightly unequal to subequal, the first 1.2 to 2.2 mm long and 1-nerved, the second 1.7 to 2.8 mm long and 3-nerved, keels scaberulous or smooth; lemma faintly or conspicuously 5-nerved, wavy-haired at base, pubescent on the keel below and near the base of the marginal veins, glabrous elsewhere; palea subequal to the lemma, 2-keeled, scaberulous on the keels, slightly 2-toothed or entire at apex; stamens 3; anthers 1.2 to 2 mm long, yellowish; lodicules 2, membranaceous, cuneate, emarginate, 0.2 to 0.3 mm long.

Type specimen: *Chung 1673* (MICH) collected on 1 July 1948 in Ullung Do. Other Korean specimens examined: Ullung Do (*Oh 2479* MICH).

Agropyron yezoense* Honda var. *glauca
glauca Chung, var. nov.

A forma typica differt praecipue spiculis glaucis 7- -9-floris glumis 3- -5-nervis.—Specimen typicum et unicum legis Nakashima 25 Jun. 1942 prope Seoul, et conservatum in U. S. Nat. Herb. sub numero 1,964,760.

This differs from the typical form mainly in the glaucous 7- to 9-flowered spikelets and 3- to 5-nerved glumes.

Culms glaucous especially near the nodes; sheaths sometimes glaucous; blades linear, acuminate, 15 to 21 cm long, 4 to 6 mm wide, scaberulous, rarely pilose; ligules 0.5 to 0.8 mm long, truncate, brownish, membranaceous; spikelets 20 to 22 mm long, 7- to 9-flowered, glaucous; glumes 7.5 to 9 mm long, 3- to 5-nerved; lemma 9 to 11 mm long, 5-nerved, punctate on the back, hispid or hispidulous near the margins and more or less

on the veins, glaucous; with a terminal scabrous awn 20 to 25 mm long; palea a little shorter than the lemma or equal, obtuse at apex, serrate-scabrous on the 2 keels, punctate and glaucous on the back; lodicules 2, membranaceous, 1 mm long; pilose beak of the caryopsis about 0.5 mm long; the hairs 1 mm long; rachilla scaberulous, 1.2 to 1.5 mm long, glaucous; callus 0.5 to 0.7 mm long; rachis scabrous on the edges, glaucous.

Type specimen: Nakashima June 25, 1942 (US 1,964,760), Seoul.

Eulalia speciosa* (Debeaux) Kuntze var. *glauca
glauca Chung, var. nov.

A forma typica differt vaginis inferioribus etiamque nodis culmorum glaucis, lodiculis ciliolatis, et antheris longioribus. A *Eulalia quadri-nervi* distincta gluma prima pilosa et eadem venis marginalibus supra mediam extinctis, lem-mate fertile longiore et laminis foliorum longioribus.—Specimen typicum in Herbario Grayano conservatum legit R. K. Smith s. n. 20 Sept. 1934, prope "Sorai Beach" in Provincia Whanghaedo.

This differs from the typical form of *Eulalia speciosa* in the glaucous lower sheaths and nodes of the culm, the ciliolate lodicules, and the longer anthers. It is distinguished from *Eulalia quadri-nervis* by the densely pilose first glume, the two marginal nerves of which disappear above the middle, the longer fertile lemma, and the longer leaf-blade.

Culms 115 cm tall, erect, unbranched, pubescent below the inflorescence, glaucous at nodes; sheaths open, longer or shorter than the internodes, lower sheaths glaucous; leaf-blades linear, acuminate, 30 to 40 cm long, about 6 mm wide, scabrous on margins, pruinose-glaucous above, pilose behind the ligules; ligules thickish, 0.7 to 1 mm long, truncate. Panicle 15 cm long, with subdigitate racemes; rachis obliquely jointed, compressed, densely whitish-pilose chiefly on edges and nodes; rachis-segments 4 to 4.5 mm long; spikelets 5 to 5.5 mm long, pilose; pedicels 3 to 3.2 mm long, sulcate, densely pilose on edges; glumes equal, broad-lanceolate, narrowly inflexed on margins; first glume subcoriaceous, 4-nerved, with the 2 marginal nerves disappearing above the middle, densely pilose on the usually slightly depressed back and on sides, hispidulous on edges near the tip; second glume chartaceous, 3-nerved, pilose on the rounded back, ciliate above the middle, puberulent on both surfaces near the tip; sterile lemma as long as the glumes,

lanceolate, chartaceous-membranaceous below, membranaceous and ciliate above, 2-nerved; fertile lemma 3.5 to 4 mm long, very narrow, membranaceous, puberulent above, slightly constricted on the back at the lower fourth, awned from between the teeth of the bifid apex; the awn 16 to 17 mm long, bent, twisted, puberulent; palea 1.5 to 2 mm long, narrowly linear, membranaceous, ciliolate at apex, thick, 0.6 to 0.7 mm long; callus very short; hairs of callus 0.8 to 1.5 mm long; stamens 3; anthers 3 to 3.2 mm long, brown; stigmas 2 to 2.5 mm long, plumose, dark-purple; style long.

Type specimen: *Smith* 9-20-1934, Sorai Beach in Whanghai-Do, GH.

Setaria lutescens (Weigel) Hubb. var. ***dura*** Chung, var. nov.

A forma typica differt lemmate flosculi inferioris convexo, chartaceo vel cartilagineo, transverse rugoso.—Specimen typicum et unicum legit Oh sub. no. 8090 in insula Sohuksan Do, conservatum in Herb. Univ. Michiganensis. This differs from the typical form of *Setaria lutescens* in the lemma of the lower floret which is convex, chartaceous to cartilaginous and slightly transversely rugose.

Annual; culms erect, about 80 cm tall, branched, compressed, striate, scaberulous below the inflorescence; leaf-blades linear-lanceolate, acuminate at apex, rounded at base, 15 to 35 cm long, 6 mm wide, scaberulous to smooth beneath, scabrous on the margins; sheaths compressed, glabrous; ligule a fringe of white hairs, 1.5 mm long, fused at base. Panicle spike-like, cylindric, dense, 5 to 11 cm long, yellowish; bristles yellowish, 5 to 12 in a cluster, the longer 2 to 4 times as long as the spikelet; spikelets 3 mm long, 1.8 to 2 mm wide, ovoid, acute; first glume 1.2 to 1.5 mm long, 3-nerved, ovate, obtuse to acute at tip, cordate at base, embracing the spikelet; second glume 1.5 to 2 mm long, 5-nerved, ovate, acute; lower floret staminate with 3 stamens, or rarely with abnormal bristles, with palea; lower lemma convex, chartaceous to cartilaginous, slightly transversely rugose, 5-nerved; its palea membranaceous, equal to and as broad as the upper palea, 2-nerved, with inflexed margins; upper floret perfect; upper lemma and palea cartilaginous, strongly transversely rugose, with inflexed margins, the lemma strongly convex and 3- to 5-nerved, the palea flat and 2-nerved; lod-

icules cuneate, truncate; stamens 3; anthers 0.8 mm long, brown; caryopsis orbicular, grayish.

Type specimen: *Oh* 8090, Sohuksan Do, MICH. Other Korean specimen examined: Seoul (?) (*Kim*, anno 1948, MICH).

Agropyron kamoji Ohwi f. ***muticum*** Chung, forma nov.

A forma typica differt glumis sterilibus acutis vel acuminatis.—Specimen typicum legit Nakashima 25 Jun. 1942 in colle Poukhansan prope Seoul, in U. S. Nat. Herb. sub num. 1,964,758.

This differs from the typical form in the acute or acuminate glumes.

Type specimen: Nakashima June 25, 1942 (US 1,964,758), Poukhansan.

Ischaemum crassipes (Steud.) Thell. f. ***pilosum*** Chung, forma nov.

A forma typica differt lamina utrinque dense pilosa.—Specimen typicum prope locum "Cheju Do" dictum, legit collector sub num. Chungii 4843, in herbario Univ. Michiganensis.

This differs from the typical form of *Ischaemum crassipes* in the densely pilose leaf-blade.

Type specimen: *Chung's* collector 4843, Cheju Do, MICH. Other Korean specimen examined: *Taquet* 3555, US.

Poa ussuriensis Roshev. f. ***angustifolia*** Chung, forma nov.

A forma typica differt lamina 1.5-2 mm lata, ligula 0.3-0.5 (0.7) mm longa.—Specimen typicum legit Ohwi (num. 844) anno 1930 prope Kyongsong in provincia Hamkyong-Pukto, conservatum in U. S. Nat. Herb. sub num. 1,964,476.

This differs from the typical form in the narrower leaf-blade and the shorter ligule.

Culms compressed, glabrous, smooth or scaberulous below the nodes; sheaths compressed, glabrous, smooth or scaberulous near the node and on the keel; leaf-blades 7 to 9 cm long, 1.5 to 2 mm wide; ligules 0.3 to 0.5 or rarely 0.7 mm long; anthers 0.5 to 0.7 mm long.

Type specimen: *Ohwi* 844 (US 1,964,476), Kyongsong, Hamkyong-Pukto.

Poa ussuriensis Roshev. f. ***scabra*** Chung, forma nov.

A forma typica differt culmis scabris infra nodos.—Specimen typicum legit Ohwi sub. num. 857, anno 1930, prope oppidum Kyongsong in provincia Hamkyong-Pukto, in U. S. Nat. Herb. conservatum (n. 1,964,477).

This differs from the typical form in the culm which is scabrous below the nodes.

Culms compressed, 3- or 4-noded, striate, scabrous below the nodes; sheaths shorter than the internodes, compressed, keeled, striate, scabrous at least near the nodes, purplish near the base; leaf-blades about 10 cm long, 2.5 to 6 mm wide; ligules 1 to 2 mm long; panicle 14 to 18 cm long, with 3 to 5 branches below, those branches 5 to 14 cm long; glumes scaberulous on the keel, the first 1-nerved and the second 3-nerved; lemmas 5-nerved, glabrous on the intermediate nerve and between the nerves, pubescent on the lower third to half of the keel and on the lower fourth of the marginal nerves, wave-haired at base; anthers 0.8 to 1 mm long; rachilla glabrous, minutely scaberulous.

Type specimen: *Ohwi 857* (US 1,964,477), Kyongsong, Hamkyong-Pukto.

***Polypogon higegaweri* Steud. f. *muticum* Chung, forma nov.**

Folia 4-8 cm longa, 2.5-3 mm lata. Ligula 2-4 mm longa. Panicula 6-6.5 cm longa, 7 mm lata; glumis 1.5-2 mm longis, muticis vel submuticis; lemmatibus muticis; antheris 0.3-0.4 mm longis. —Specimen typicum legis Oh sub num. 8257 in insula Sohuksan Do.

Leaf-blades 4 to 8 cm long, 2.5 to 3 mm wide; ligules 2 to 4 mm long. Panicle 6 to 6.5 cm long, 7 mm wide; glumes 1.5 to 2 mm long, awnless or nearly so; lemmas awnless; anthers 0.3 to 0.4 mm long.

Type specimen: Oh 8257, Sohuksan Do, MICH.

New combinations are as follows:

Calamagrostis arundinacea (L.) Roth var. *heterogluma* (Nakai) Chung, comb. nov. (*Calamagrostis longisetata* Hack. var. *heterogluma* Nakai in Bot. Mag. Tokyo **35**: 149, 1921.)

Diarrhena fauriei (Hack.) Ohwi var. *koryoensis* (Honda) Chung, comb. nov. (*Diarrhena koryoensis* Honda in Koryo-shikenrin-no-ippan 79, 1932.)

Miscanthus sinensis Anderss. var. *coreensis* (Hack.) Chung, comb. nov. (*Miscanthus coreensis* Hack. in Bull. Herb. Boiss. 2 ser., **4**: 531, 1904.)

Miscanthus sinensis Anderss. var. *ionandros* (Nakai) Chung, comb. nov. (*Miscanthus ionandros* Nakai in Bot. Mag. Tokyo **41**: 13, 1917.)

Miscanthus sinensis Anderss. var. *longiberbis* (Hack.) Chung, comb. nov. (*Miscanthus matsu-*

murae Hack. var. *longiberbis* Hack. in Bull. Herb. Boiss. 2 ser., **4**: 532, 1904.)

Miscanthus sinensis Anderss. var. *nakaianus* (Honda) Chung, comb. nov. (*Miscanthus nakaianus* Honda in Bot. Mag. Tokyo **42**: 130 & 179, 1928, also in Journ. Fac. Sci. Univ. Tokyo sec. 3, **3**: 389, 1930.)

Tripogon chinensis Hack. var. *longiaristata* (Honda) Chung, comb. nov. (*Tripogon longiaristata* Honda in Bot. Mag. Tokyo **41**: 11 & 16, 1927, also in Journ. Fac. Sci. Univ. Tokyo sec. 3, **3**: 145, 1930.)

Eragrostis pilosa (L.) Beauv. f. *mullicaulis* (Steud.) Chung, comb. nov. (*Eragrostis multi-caulis* Steud., Synop. Pl. Glum. **1**: 426, 1855.)

Ischaemum eriostachyum Hack. f. *stenopterum* (Hack. ex Nakai) Chung, comb. nov. (*Ischaemum anthephoroides* (Steud.) Miq. var. *stenopterum* Hack. ex Nakai in Bot. Mag. Tokyo **33**: 3, 1919.)

Polypogon higegaweri Steud. f. *demissus* (Steud.) Chung, comb. nov. (*Polypogon demissus* Steud., Synop. Pl. Glum. **1**: 422, 1855.)

Thirteen species and eleven varieties of grasses are endemic in Korea: eight species and three varieties in Northern Korea, three species and three varieties in Central Korea, two species and three varieties in Southern Korea, and two varieties in Central and Southern Korea.

Endemic grasses are as follows:

Alopecurus aequalis Sobal. var. *brachytrichus* (Ohwi) Ohwi in Hamgyong-pukto,
Calamagrostis arundinacea (L.) Roth var. *hymenoglossa* Ohwi in Hamgyong-pukto,
Calamagrostis paishanensis Nakai in Mt. Paektu, Hamgyong-pukto,
Calamagrostis subacrochaeta Nakai in Mount Nanguim, Pyongan-pukto,
Elymus mollis Trin. var. *coreensis* (Hack.) Honda in Wonsan, Hamgyong-namdo,
Festuca blepharogyna (Ohwi) Ohwi in Mt. Sullyong,
Ischaemum coreanum Nakai ex Honda in Seoul,
Miscanthus sinensis Anderss. var. *coreensis* (Hack.) Chung in Sepo, Cheju Do, and Tong Do,
Miscanthus sinensis Anderss. var. *longiberbis* (Hack.) Chung in Changwon,
Miscanthus sinensis Anderss. var. *nakaianus* (Honda) Chung in Kangwondo,
Oplismenus undulatifolius (Ard.) Beauv. var. *elongatus* Honda in Kwangnung, Kyonggido,
Poa deschampsioides Ohwi in Mt. Duryu, Kwangmobong, and Chailbong, Hamgyong-pukto,
Poa hamhungensis Chung in Hamhung, Hamgyong-namdo,
Poa kanboensis Ohwi in Mt. Kwangmobong, Hamgyong-pukto,
Poa kumgangsani Ohwi in Mt. Kumgang, Kangwondo,

Poa kyongsongensis Chung in Kyongsong, Hamgyong-pukto,
Poa takeshimana Honda in Ullungo Do,
Poa ullungdoensis Chung in Ullung Do,
Puccinellia coreensis Honda in Mokpo and Cheju Do,
Sasa coreana Nakai in Hamgyong-pukto,
Sasa quelpaertensis Nakai in Cheju Do,
Sasamorpha borealis (Hack.) Nakai var. *chiisanensis* (Nakai) Chung in Mt. Chiri,
Setaria lutescens (Weigel) Hubb. var. *dura* Chung in Sohuksan Do,
Tripogon chinensis Hack. var. *coreensis* Hack. in Chinnampo, Sorai in Whanghaedo, and Cheju Do,

Tripogon chinensis Hack. var. *longiaristata* (Honda) Chung in Cheju Do.

Distribution of the grasses in Korea and the nearest systematic and geographic relationships of endemic species are fully discussed in the *Manual*. A brief classification of the grasses by habitats and a list of the important collections of Korean grasses in four herbaria of U. S. A. are given. A map of Korea with three divisions (North, Central, and South) is included, and the latter indicates location of the important localities represented by collections in the four herbaria which have been cited.

ZOOLOGY.—*A new species of Pararchinotodelphys (Copepoda: Cyclopoida) with remarks on its systematic position.* PAUL L. ILLG, Department of Zoology, University of Washington.¹

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Important revisions of concepts long held regarding ascidicolous copepods have resulted from recent contributions of Karl Lang (1948, 1949). His family Archinotodelphyidae (1949) is significant because it presents anatomical and ecological features which illustrate transition from casually occurring associates of ascidians to anatomically modified forms reflecting ecological dependence on these host organisms as providing either shelter or nutrition. He considers this family to occupy an intermediate position serving as the directly connecting link between the families Cyclopinidae and Notodelphyidae. The whole series then readily conforms to the long existing definition of the Cyclopoida Gnathostoma. The use of the order Notodelphyoida Sars is accordingly abandoned by Lang, and he further points out the logic of incorporating various ascidicolous copepods, other than notodelphyids, but included by Sars in his suborder, in some of the other subdivisions of the Cyclopoida. Two monotypic genera are recognized by Lang in the new family. The species here to be described is a congener of *Pararchinotodelphys phallusiae* (Hansen), 1923.

Family ARCHINOTODELPHYIDAE Lang, 1949
 Pararchinotodelphys Lang, 1949

The urosome in the female consists of the segment of the fifth legs, a complex genital segment, representing fusion of 1 anatomically thoracic segment and one anatomically abdominal segment, and three free abdominal segments. The antennule consists of many segments, 16 or 17 being the number so far known. The antenna is 4-segmented. The mandible palp has a 2-segmented endopodite and 4-segmented exopodite. The maxilliped is 3- or 4-segmented. The natatory legs have both rami 3-segmented. The fifth legs are 2-segmented; four setae are borne on the terminal segment, one on the basal segment at the distolateral corner. Type species, *P. phallusiae* (Hansen), 1923.

Pararchinotodelphys gurneyi, n. sp.

FIGS. 1-14

Specimens examined.—4 females, all adult; from branchial cavities of specimens of *Styela partita* (Stimpson) (U.S.N.M. no. 3181), off Marthas Vineyard, Mass., *Fish Hawk* station 940, August 4, 1881, depth 134 fathoms.

Types.—Holotypic female, U.S.N.M. no. 97608; paratypes no. 92536; all from the one known collection.

Description.—FEMALE (Figs. 1-14): The body presents in outward aspect (Fig. 1) the generalized cyclopoid characters, such as those seen

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